WestRock

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Stevenson, AL 35772

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www.westrock.com



May 30, 2017

Mr. Ronald W. Gore
Chief, Air Division
Alabama Department of Environmental Management
1400 Coliseum Boulevard
Montgomery, AL 36110-2400

**VIA Electronic and Overnight Mail: 8103 9461 8128**

**Subject: WestRock Stevenson Mill – Request for Modification of Recovery Boiler Permit Conditions**

Dear Mr. Gore,

As discussed with you and your staff on May 11, WestRock has determined that three changes are needed to Alabama Department of Environmental Management (ADEM) Permit 704-0014-X010 (the Stevenson Mill's Title V Permit) pertaining to the operation of the chemical recovery boiler. This letter provides background information about recent changes to the recovery boiler, describes the extensive efforts that WestRock has put forth to resolve the technical and emissions-related issues that have resulted from those changes, describes the permit conditions that need to be modified, and provides the rationale behind the request to modify these conditions.

**Background**

In 2015 and 2016, WestRock carried out a project to convert the chemical pulping process at the Stevenson Mill from a neutral sulfite semi-chemical (NSSC) process to a sodium carbonate/sodium hydroxide semi-chemical process. This conversion involved making physical changes to the mill's chemical recovery boiler to enable it to burn spent carbonate/caustic pulping liquor. The changes included modification of the boiler's liquor guns, additional natural gas firing capability, additional upper level tertiary air ports, and other changes. Two new natural gas burners, which are each rated at a heat input level of 20 MMBtu/hr, were added to the unit. The maximum continuous rating (MCR) of the boiler was raised from 418 MMBtu/hr to 520 MMBtu/hr, and the unit's fossil fuel firing capability was raised to 176 MMBtu/hr.

As described in the Prevention of Significant Deterioration (PSD) permit application for the project that was submitted to ADEM in March 2015, the new natural gas burners were expected to be in service at all times, utilizing approximately 10 MSCFH of natural gas or less. The purpose of providing additional natural gas firing capability on the boiler was to support operational stability of the unit and to promote smelt spout flow while the unit was burning carbonate liquor. The PSD permit application was developed using guaranteed emission rates and estimated natural gas consumption rates provided by the boiler's original equipment manufacturer, Babcock & Wilcox (B&W).

The modified recovery boiler was initially started up in August 2016. In December 2016, mill staff found that the boiler's natural gas consumption rate since startup had been considerably higher than B&W had estimated during the design phase of the project. The

mill has found that between 80 and 100 MSCFH of natural gas firing has been required, rather than the 10 MSCFH that B&W had originally expected.

Subsequently, WestRock and B&W have conducted extensive investigations to understand why natural gas firing rates have been higher than were originally estimated. The mill has found that it needs to fire more natural gas than originally estimated to ensure compliance with the boiler's permit limits for nitrogen oxides ($NO_x$) and carbon monoxide (CO). These limits are as follows:

- $NO_x$: 120 ppmvd at 8% $O_2$ (30-day rolling average) and 72.92 lb/hr
- CO: 213 ppmvd at 8% $O_2$ (3-hour rolling average) and 87.50 lb/hr

**Physical Description of the Stevenson Mill Recovery Boiler**

As described in Section 2.0 of the PSD Permit Application document, the physical changes that were made to the recovery boiler included modifications to the liquor guns, installation of new auxiliary natural gas burners, additional air ports and dampers in the upper tier of the tertiary air level, new automatic combustion air port rodders, and conversion of the steam coil air heaters from utilizing low pressure to high pressure steam. The tertiary air fan and its motor were replaced, and the ductwork serving the boiler's tertiary air ports was repaired and restored to service.

The new automatic port rodders installed in the recovery boiler's primary and secondary combustion air ports were intended to assist in stabilizing the boiler's char bed by maintaining a consistent port opening and consistent air flow to the furnace. Seven new upper level tertiary air ports with butterfly dampers were installed; four new upper tertiary air ports were installed on the front wall, and these ports were interlaced with three new tertiary air ports on the rear wall. The existing upper level tertiary air duct was modified in order to supply the new tertiary air ports.

Previously, the NSSC liquor that was fired in the recovery boiler had a solids content of 75 – 76%. The sodium carbonate/sodium hydroxide (soda) liquor now being fired is different than the NSSC liquor that was previously fired in several important characteristics. The principal difference is its higher viscosity, which creates a number of issues that were required to be addressed, including:

- Poor pumpability;
- Poor atomization of liquor droplets typically required for optimum combustion; and
- Limits firing liquor to a minimum of 65% solids (by weight).

Firing the lower solids content soda liquor requires that more heat be provided to the lower furnace for char bed stability and CO emissions control. In addition, the higher melting point of the smelt derived from soda liquor has meant that the temperature of the hearth/lower furnace has had to be maintained at a higher level (relative to temperatures in a NSSC or kraft unit) to ensure adequate smelt exit flow. As described above, B&W predicted that more natural gas would need to be fired in the boiler for combustion stabilization and to maintain smelt flow, but the firm underpredicted the amount of natural gas that would be required to achieve this operating state. The requirement to operate the hearth/lower furnace at higher temperatures has likely resulted in more thermal $NO_x$ formation than found in a typical NSSC or kraft recovery furnace.

In addition to having a lower solids content, the nitrogen content of the soda pulping liquor now being generated at the Stevenson mill (0.28%) is higher than the nitrogen content of either NSSC liquor (about 0.16%) or typical kraft liquor (0.12%). According to information provided to WestRock by the National Council for Air and Stream Improvement (NCASI), the greater levels of $NO_x$ generated in the lower furnace coupled with the higher fuel nitrogen in soda liquor has likely produced $NO_x$ emissions levels that are approximately twice as high as with kraft liquor fired units.

The Stevenson Mill's recovery boiler includes a tertiary air system that was upgraded as part of the Project. However, the small capacity and relatively short furnace height of the recovery boiler represent physical constraints that have prevented WestRock from making more extensive combustion air system modifications on this unit. In particular, the physical dimensions of this boiler are insufficient for the installation of quaternary air staging, which is a means to reduce CO and $NO_x$ emissions on these units

This boiler originally had four distinct levels or stages of air introduction in service (primary air, secondary air, lower tier tertiary air, and upper tier tertiary air on the front wall). The new upper tier tertiary nozzle interlaced arrangement with four front wall nozzles and three rear wall nozzles was designed to push more combustion air to the rear wall of the furnace under the nose arch. All the tertiary air is delivered at the upper tier level in order to provide maximum air jet velocity/penetration, optimum combustion air mixing and utilization, and to minimize $NO_x$, CO, and VOC emissions from the boiler.

B&W requires that the highest level of combustion air introduction be no more than 30 feet above the liquor guns and at least 25 feet below the boiler's nose arch. These limits are necessary to provide adequate air/flue gas mixing to provide for complete incineration of the combustible constituents in the flue gas.

- The liquor guns in this boiler are located at an elevation of 684.75 feet above mean sea level (AMSL);
- The upper tier of tertiary air nozzles (including the new front wall and rear wall ports) is located at an elevation of 704.75 feet AMSL;
- Thus the distance between the liquor guns and the upper tier of tertiary nozzles is 20 feet;
- Moreover, centerline of the boiler's nose arch is located at an elevation of 731 feet AMSL, which is 26 feet 3 inches above the upper tier of the tertiary air nozzles.

Consequently, there is only a minimal amount of space (1 foot, 3 inches) above the upper tier of tertiary air nozzles for installation of additional combustion air ports before B&W's limit on the minimum distance to the boiler's nose arch would be met. This physical constraint means that quaternary air staging (i.e., a new quaternary fan and windbox with associated air nozzles) cannot be installed on this boiler.

In addition, Stevenson recovery boiler operators have struggled with black liquor char deposits sintering in the furnace during increases of black liquor firing rate, causing fused clinkers. The clinkers smolder in the furnace, which leads to irregular, high concentrations of CO emissions that cannot be adequately addressed with changes in combustion air distribution or flow. After discovering the cause of clinker formation, adjustments were made to the liquor gun nozzles to improve liquor firing patterns and distribution in the

furnace. The atomizing steam input and angle of the nozzles were changed to help prevent liquor char deposits on the furnace walls. Other longer term solutions were also investigated and a Management of Change (MOC) authorization was initiated to study replacing the existing liquor guns with an improved design to enhance the liquor spray pattern to minimize char formation; however, none of these efforts alone have eliminated the clinker formation issue.

**Corrective Action Measures**

Since December 2016, WestRock has expended significant internal resources to investigate the reasons for the high levels of natural gas firing and variable CO emissions. These investigations have been augmented by a significant amount of time and effort put forth by B&W's field engineers to conduct evaluations and to adjust the boiler's control variables, including developing different fuel and air curves than those previously developed due to the changes in combustion air flow and distribution (B&W designed the Stevenson recovery boiler system upgrades/modifications, managed the project installation, and provided field engineering services support for startup and tuning). We have contracted with B&W for weeks of additional tuning efforts and training to optimize boiler operations and to minimize CO while remaining in compliance with the unit's $NO_x$ permit limit.

In order to minimize the recurrence of CO exceedances, the following corrective actions and proactive measures also have been implemented:

1. Upon startup of the new process, it was discovered that the ID fan was limited in its ability to modulate flue gas flow through the boiler and positively impact CO and $NO_x$. To address this issue, the mill elected to reduce the differential pressure across the old scrubber formerly used for $SO_2$ control by removing the internal packing media. The mill proceeded with packing removal during an outage from September 12 - 16, 2016, which significantly improved the capacity for combustion air flow through the boiler.

2. An Emergency Operating Procedure (EOP) for CO emissions control has been implemented and all boiler operators have been trained in the procedure.

3. Power & Recovery Management staff has conducted one-on-one discussions with the boiler operators on each shift reiterating the expectation that environmental permit exceedances are not acceptable.

4. The Stevenson Mill process information (PI) management system used to collect operational and environmental data has recently been upgraded to allow alerts regarding abnormally high emissions to be sent to mill management personnel via text messages to prompt early responses to these issues. These alerts are configured in the distributed control system (DCS) that archives information from the CEMS. These alerts are also communicated to the boiler operators at different alarm points to improve the accuracy and frequency of the information the operators have available to them to make proper decisions.

5. After discovering the cause of clinker formation, adjustments were made to the liquor gun nozzles to improve liquor firing patterns and distribution in the furnace to help prevent the formation of liquor char deposits on the furnace walls. Other longer term solutions were also investigated and a Management of Change (MOC) authorization was initiated on February 18, 2017 to determine whether replacement of the existing liquor guns with an improved design to enhance the liquor spray pattern to minimize char formation and improve control of combustion-related pollutants would be beneficial. The original B&W scope of work for the recovery boiler modifications did not include this new design soda liquor gun as it was deemed unnecessary. WestRock and B&W are currently investigating whether the improved liquor gun design will offer further reductions in clinker formation.

WestRock has concluded that at the boiler's typical day-to-day liquor firing rate, the performance guarantee for CO provided by B&W (213 ppm @ 8% $O_2$) cannot be met, and that the original natural gas firing rate estimate of 10 MSCFH that B&W provided was erroneously low. Therefore, permit changes are needed to modify the unit's CO emissions limit.

**Evaluation of CO CEMS Data**

At WestRock's request, NCASI carried out an evaluation of actual CO emissions data from the modified recovery boiler (data from the period August 2016 to April, 2017). This evaluation found that 1-hour average CO emission rates during periods of relatively low natural gas firing were higher and more variable than emission rates during periods of relatively high gas firing. NCASI also used the actual CEM data to develop a series of probability models in order to characterize the likelihood of any CO emission rate being measured at some particular time in the future. Monte Carlo techniques were then used to generate 10 years of predicted CO emission rates (approximately 87,000 simulated 1-hour concentrations). The predicted emission rates were statistically analyzed using various averaging times. NCASI's analysis found no predicted exceedances of a 200 ppm CO limit using a 30-day averaging period.

**Rationale for Modified CO Emissions Limit**

Because the CPUP at Stevenson was subject to PSD for CO, the CO emissions limit in Proviso 5 in the "Emissions Standards" portion of the recovery boiler section of the Title V permit represents Best Available Control Technology (BACT) for this pollutant. In a letter[1] dated March 3, 2014 to the Washington State Department of Ecology, EPA Region X laid out three criteria that must be met in order for a PSD BACT limit to be amended. The rationale for requiring that these three criteria be met is described in a policy memorandum[2] written by EPA's Office of Air Quality Planning and Standards dated November 19, 1987. EPA's position is that a BACT limit can only be revised if all three of the following criteria are met:

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[1] Letter from Kate Kelly, Director of EPA's Region X Office of Air, Waste and Toxics to Stuart Clark, Washington State Department of Ecology, March 3, 2014

[2] "Request for Determination on Best Available Control Technology (BACT) Issues – Ogden Martin Tulsa Municipal Waste Incinerator Facility", memo from Gary McCutchen and Michael Trutna, EPA OAQPS to David Sullivan, Region VI Enforcement Section, November 19, 1987

1) The source was constructed per the permit requirements,
2) The current BACT levels are inappropriate as a result of errors, faulty data, or incorrect assumptions contained in the permit application, and
3) The source has investigated all available options to reduce emissions and has demonstrated that compliance cannot be achieved (with the current BACT limit).

As to the first criterion, ADEM's Scott Sanders has confirmed that the recovery boiler modifications were carried out in conformance with the permit conditions during his on-site inspection following completion of construction. These conclusions were incorporated into the Permanent Authorization to Operate that was issued to WestRock by ADEM following this inspection.

As to the second criterion, the operating history of the modified recovery furnace since startup demonstrates that the CO emissions guarantee provided by B&W (213 ppmvd corrected to 8% $O_2$) was not valid at the liquor firing rates where the boiler will operate for the majority of the time. The BACT conclusions reached in the permit application are thus based on incorrect information, including B&W's conclusion that there would be sufficient liquor to enable the boiler to operate without significant turndown and that CO emissions from the recovery furnace would not vary considerably throughout the range of normal boiler operation.

And finally as to the third criterion as described above, WestRock has investigated all available options to reduce CO emissions from the boiler and expended substantial technical resources to develop an engineering solution to the issue. Stevenson's recovery boiler is already equipped with a tertiary air system that reduces CO and VOC emissions from the unit. The small capacity and relatively short furnace height of Stevenson's recovery boiler do not allow for the installation of more advanced CO emission control alternatives such as quaternary air staging. Moreover, as described in Section 4.3.3.2 of the Air Permit Application, the emission control technology that was concluded to be representative of BACT for CO (good combustion practices and staged combustion) is the most stringent technically feasible alternative available on the Stevenson recovery boiler. Combustion controls are the only alternative listed for control of CO emissions in any of the recovery boiler listings in EPA's RACT/BACT/LAER Clearinghouse[3]. In particular, add-on emission control alternatives such as catalytic oxidation are technically infeasible on recovery boilers.

As explained above, both WestRock and B&W have expended significant resources in the effort to investigate the causes of CO emissions and to reduce emissions to the maximum extent practical using the existing combustion air system.

Therefore, all three of the criteria identified by EPA as necessary preconditions for amending the BACT emission limit for the Stevenson recovery boiler are met.

[3] A summary of RACT/BACT/LAER Clearinghouse listings for recovery boilers was provided in Appendix C of the PSD Permit Application for the CPUP.

**Removing the 40 CFR 60 Subpart Db Exemption Limit**

In addition to the CO issues discussed above, WestRock is seeking to remove Proviso 4 from its Title V permit. Proviso 4 in the "Emissions Standards" portion of the recovery boiler section of the mill's Title V Permit restricts the annual capacity factor for No. 2 fuel oil and natural gas firing to ten percent or less. Per the requirements in 40 CFR 60 Subpart Db at §60.40b(j)(1), this proviso was included in the permit so that the recovery furnace would qualify for exemption from the Subpart Db $NO_x$ emission standards. This capacity factor limit equates to an average fossil fuel firing rate of 52 MMBtu/hr, or 49.9 MSCFH of natural gas firing (assuming 1042 Btu/SCF as the average gross calorific value for natural gas at the Stevenson Mill). As described above, however, WestRock has learned that considerably more natural gas firing than this will be required in order to maintain stable boiler operation and compliance with emission limits. At the anticipated future natural gas firing rate (up to 90 MSCFH), WestRock does not expect to be able to consistently meet the current annual capacity factor limitation.

The recovery boiler has a maximum heat release rate of 520 MMBtu/hr and a furnace volume of 23,000 $ft^3$. Thus the unit's heat release rate is 22,609 Btu/hr-$ft^3$, which is less than 70,000 Btu/hr-$ft^3$. Therefore for the purposes of Subpart Db, the recovery boiler is classified as a low heat release rate unit.

Accordingly, when this Proviso 4 has been removed from the permit, the recovery boiler will be subject to the following $NO_x$ emission limits:

- When firing natural gas alone: 43 ng/J (0.10 lb/MMBtu) (§60.44b(a)(1)), and
- When firing natural gas in combination with black liquor: 86 ng/J (0.20 lb/MMBtu) (§60.44b(l)(1)) ,

Per §§60.44b(i), (j)(1) and (j)(2) compliance with these limits is to be met on a 30-day rolling average basis as long as the boiler's 30-day rolling average capacity factor for natural gas and fuel oil firing is less than or equal to 30%.

The boiler's current stack exhaust emission limit for $NO_x$ is 120 ppm @ 8% $O_2$, 30-day average. This is equivalent to the Subpart Db mixed fuel-firing $NO_x$ limit of 0.20 lb/MMBtu when the rounding conventions for emission standards compliance calculations at 40 CFR 60.13(h)(3) are taken into account.

Therefore WestRock believes there is no need to change the boiler's existing $NO_x$ emission limit in conjunction with removal of the annual capacity factor limitation for fossil fuel firing. The recovery boiler's existing Continuous Emissions Monitoring System (CEMS) for $NO_x$ will be used to demonstrate initial and ongoing compliance with the $NO_x$ emission limits using the procedures in §60.46b(e) and §60.48b(b), respectively.

40 CFR 60 Subpart Db also includes limits on sulfur dioxide emissions, but per §60.42b(k)(2) the recovery boiler will not be subject to these limits because it will fire only natural gas or natural gas in combination with black liquor and because the unit's potential sulfur dioxide emission rate when firing natural gas in combination with black liquor will be less than 140 ng/J (0.32 lb/MMBtu).

Similarly, the recovery boiler will not be subject to any of the 40 CFR 60 Subpart Db emission limits on particulate matter because per §60.43b(a) through (k), those limits only apply to units that combust coal, oil, wood, or municipal-type solid waste, either alone or in combination with other fuels.

WestRock will be subject to the following other requirements under Subpart Db when Proviso 4 has been removed from the permit:

- Report performance test data and $NO_x$ CEMS performance evaluation results (§60.49b(b)),
- Record and maintain daily fuel consumption and annual capacity factor data (§60.49b(d)),
- Maintain records of steam generating unit operating day information ((§§60.49b(g)),
- Submit excess emission reports (§60.49b(h)(2)(i)),
- Submit $NO_x$ monitoring reports (§60.49b(i)), and
- Maintain emissions-related records for a period of 2 years (§60.49b(o)).

Per §60.49b(v) reports may be submitted electronically and per §60.49b(w) reports are to be submitted on a semiannual basis by the 30th day following the end of the reporting period.

**Summary**

Accordingly, with this letter WestRock requests that ADEM make the following changes to the "Emission Standards" portion of the recovery boiler section in the mill's Title V Permit:

- Remove Proviso 4, and
- Modify Proviso 5 to state that the rate based limit for CO from the unit is 200 ppmvd @ 8% $O_2$ (30-day rolling average compliance monitoring period basis).

A computer dispersion modeling assessment of the impact that the modified recovery boiler would have on ambient CO concentrations was conducted in conjunction with development of the March 2015 PSD Permit Application for the Chemical Pulp Utilization Project (CPUP) at the Stevenson Mill. As described in greater detail in Section 6.1 of the application document, this assessment demonstrated ambient CO impacts would be substantially below the two Significant Impact Levels (SILs) for this pollutant, as follows:

- 170 ug/$m^3$ versus the 2000 ug/$m^3$ SIL for the 1-hour CO National Ambient Air Quality Standard (8.5% of the SIL)
- 29 ug/$m^3$ versus the 500 ug/$m^3$ SIL for the 8-hour standard (5.7% of the SIL)

Please note that WestRock is not seeking to modify the existing CO mass emission limit for the recovery boiler, which will remain at 87.50 lb/hr. Accordingly, the original computer dispersion modeling impacts assessment for this pollutant remains valid, as does the original conclusion that that CO emissions from the modified recovery boiler will have an insignificant impact on ambient CO concentrations.

Finally, the recovery boiler is subject to certain emission limitations for gaseous organic hazardous air pollutants (HAPs) per Proviso 9 in the "Emissions Standards" portion of the recovery boiler section of the Title V Permit and §63.862(c)(2) of 40 CFR 63 Subpart MM. The mill utilizes the normal combustion operation of the recovery boiler to meet these requirements, and thus per §63.864(e)(14) was required to develop and implement a site-specific monitoring plan to demonstrate continuous compliance with the gaseous HAP limits. The Stevenson Mill elected to continuously monitor CO emissions as a surrogate for gaseous HAPs. This requirement is detailed in Proviso 11 of the "Emissions Monitoring" portion of the recovery boiler section of the Title V permit.

WestRock believes that the use of CO emissions as a surrogate for gaseous HAP emissions remains appropriate, and that the proposed CO limit of 200 ppmvd @ 8% $O_2$ is an appropriate indicator of compliance with the Subpart MM gaseous HAP requirements. However, to be consistent with the proposed change to the averaging time of the CO emissions limit, WestRock requests that reference to "any three-hour rolling average carbon monoxide emission rate" in the last sentence of Proviso 11 be changed to "any 30-day rolling average carbon monoxide emission rate."

Please contact me by email at angela.aten@westrock.com or by phone at (256) 437-3305 with any questions about this request.

Sincerely,

Angela Aten
Stevenson Mill Environmental Manager

Attachments:
ADEM Form 103
ADEM Form 105

cc: David Sherrod
Steve Jelinek
File I. 129

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT (AIR DIVISION)

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Facility Number | | | | - | | | | |

## CONSTRUCTION/OPERATING PERMIT APPLICATION
## FACILITY IDENTIFICATION FORM

1. Name of Facility, Firm, or Institution: WestRock CP, LLC

**Facility Physical Location Address**

Street & Number: 1611 County Road 85

City: Stevenson County: Jackson Zip: 35772

**Facility Mailing Address (If different from above)**

Address or PO Box: P.O. Box 508

City: Stevenson State: AL Zip: 35772

**Owner's Business Mailing Address**

2. Owner: WestRock CP, LLC

Street & Number: 504 Thrasher Street City: Norcross

State: GA Zip: 30071 Telephone: 770-448-2193

**Responsible Official's Business Mailing Address**

3. Responsible Official: Joseph Vaughn Title: General Manager

Street & Number: 1611 County Road 85

City: Stevenson State: AL Zip: 35772

Telephone Number: 256-437-3876 E-mail Address: joe.vaughn@westrock.com

**Plant Contact Information**

4. Plant Contact: Angela Aten Title: Environmental Manager

Telephone Number: 256-437-3305 E-mail Address: angela.aten@westrock.com

5. Location Coordinates:

UTM 085-47-00 W E-W 34-51-18 N N-S

Latitude/Longitude 85°47'11" LAT 34°50'53" LONG

6. **Permit application is made for:**

- ☐ **Existing source (initial application)**
- ☐ **Modification**
- ☐ **New source (to be constructed)**
- ☐ **Change of ownership**
- ☐ **Change of location**
- ☑ **Other (specify)** CO Permit revision and elimination of 10% fossil fuel annual capacity factor limit.

**Existing source (permit renewal)**

**If application is being made to construct or modify, please provide the name and address of installer or contractor**

TBD

_____ **Telephone** _____

**Date construction/modification to begin** TBD **to be completed** TBD

7. **Permit application is being made to obtain the following type permit:**

- ☑ **Air permit**
- ☐ **Major source operating permit**
- ☐ **Synthetic minor source operating permit**
- ☐ **General permit**

8. **Indicate the number of each of the following forms attached and made a part of this application: (if a form does not apply to your operation indicate "N/A" in the space opposite the form). Multiple forms may be used as required.**

| | |
|---|---|
| N/A | **ADEM 104 - INDIRECT HEATING EQUIPMENT** |
| 1 | **ADEM 105 - MANUFACTURING OR PROCESSING OPERATION** |
| N/A | **ADEM 106 - REFUSE HANDLING, DISPOSAL, AND INCINERATION** |
| N/A | **ADEM 107 - STATIONARY INTERNAL COMBUSTION ENGINES** |
| N/A | **ADEM 108 - LOADING, STORAGE & DISPENSING LIQUID & GASEOUS ORGANIC COMPOUNDS** |
| N/A | **ADEM 109 - VOLATILE ORGANIC COMPOUND SURFACE COATING EMISSION SOURCES** |
| N/A | **ADEM 110 - AIR POLLUTION CONTROL DEVICE** |
| N/A | **ADEM 112 - SOLVENT METAL CLEANING** |
| N/A | **ADEM 438 - CONTINUOUS EMISSION MONITORS** |
| N/A | **ADEM 437 - COMPLIANCE SCHEDULE** |

9. **General nature of business: (describe and list appropriate standard industrial classification (SIC) and North American Industry Classification System (NAICS) (www.naics.com) code(s)):**

The manufacture of corrugating medium paperboard (SIC Code - 2631 and NAICS Code 322130).

10. **<u>For those making application for a synthetic minor or major source operating permit</u>, please summarize each pollutant emitted and the emission rate for the pollutant. Indicate those pollutants for which the facility is major.**

| Regulated pollutant | Potential Emissions* (tons/year) | Major source? yes/no |
|---|---|---|
| Nitrogen Oxides | | |
| Sulfur Oxide | | |
| PM10 | | |
| Carbon Monoxide | | |
| VOC | | |
| TRS | | |
| TSP | | |
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***Potential emissions are either the maximum allowed by the regulations or by permit, or, if there is no regulatory limit, it is the emissions that occur from continuous operation at maximum capacity.**

major source operating permit, indicate the compliance status by program for each emission unit or source and mine compliance. Also cite the specific applicable requirement.

(description)

| Standard | Program[1] | Method used to determine compliance | Compliance Status | |
|---|---|---|---|---|
| | | | IN[2] | OUT[3] |
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PS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)),SIP regulation, Title IV, Enhanced ecify)

ADEM Form-437)

cluded as separate entries

12. List all insignificant activities and the basis for listing them as such (i.e., less than the insignificant activity thresholds or on the list of insignificant activities). Attach any documentation needed, such as calculations. No unit subject to an NSPS, NESHAP or MACT standard can be listed as insignificant.

| Insignificant Activity | Basis |
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**PERMIT APPLICATION**
**FOR**
**MANUFACTURING OR PROCESSING OPERATION**

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
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1. Name of firm or organization: WestRock CP, LLC - Stevenson Mill

2. Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.

Operating scenario number 1

The chemical recovery system converts spent pulping chemicals recovered in the heavy black liquor produced by the evaporator system to fresh pulping liquor. Heat from the burning of the organic constituents of the liquor in the boiler is used to produce steam; inorganic salts fall to the bottom of the boiler and melt, are chemically converted to carbonate, and subsequently flow to the smelt dissolving tank where green liquor is formed. Sodium carbonate from the salt cake mix tank is supplied to the smelt tank to provide makeup chemicals to the recovery system. Boiler flue gasses are directed to the wet ESP for particulate matter control and then to the wet scrubber for final conditioning before exhausting to atmosphere. Refer to the end of this form for the process flow diagrams associated with this unit.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Chemical Recovery Boiler

Make: N/A Model: N/A

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 58,334 (dry)

Manufactured date: N/A Proposed installation date: N/A

Original installation date (if existing): 1999

Reconstruction or Modification date ( if applicable): 2001, 2015

4. Normal operating schedule:

Hours per day: 24 Days per week: 7 Weeks per year: 52

Peak production season (if any): None

13. List and explain any exemptions from applicable requirements the facility is claiming:

a. N/A

b.

c.

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14. List below other attachments that are a part of this application(all supporting engineering calculations must be appended):

a. Request for Modification of Recovery Boiler Permit Conditions

b.

c.

d.

e.

f.

g.

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i.

**I CERTIFY UNDER PENALTY OF LAW THAT, BASED ON INFORMATION AND BELIEF FORMED AFTER REASONABLE INQUIRY, THE STATEMENTS AND INFORMATION CONTAINED IN THIS APPLICATION ARE TRUE, ACCURATE AND COMPLETE.**

**I ALSO CERTIFY THAT THE SOURCE WILL CONTINUE TO COMPLY WITH APPLICABLE REQUIREMENTS FOR WHICH IT IS IN COMPLIANCE, AND THAT THE SOURCE WILL, IN A TIMELY MANNER, MEET ALL APPLICABLE REQUIREMENTS THAT WILL BECOME EFFECTIVE DURING THE PERMIT TERM AND SUBMIT A DETAILED SCHEDULE, IF NEEDED FOR MEETING THE REQUIREMENTS.**

Joe Young — GENERAL MANAGER — 5/24/17

**SIGNATURE OF RESPONSIBLE OFFICIAL** **TITLE** **DATE**

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

| Material | Process Rate Average (lb/hr) | Maximum (lb/hr) | Quantity tons/year |
|---|---|---|---|
| Black Liquor | N/A | 58,334 (dry) | 255,500 (dry) |
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6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on Form ADEM-104): 176 MMBtu/hr

| Fuel | Heat Content | Units | Max. % Sulfur | Max. % Ash | Grade No. [fuel oil only] | Supplier [used oil only] |
|---|---|---|---|---|---|---|
| Coal | | Btu/lb | | | | |
| Fuel Oil | ~ 140,000 | Btu/gal | 0.0015 | negligible | No. 2 Distillate | Not Applicable |
| Natural Gas | 1,042 | Btu/ft$^3$ | negligible | negligible | | |
| L. P. Gas | | Btu/ft$^3$ | | | | |
| Wood | | Btu/lb | | | | |
| Other (specify) | | | | | | |

7. Products of process or unit:

| Products | Quantity/year | Units of production |
|---|---|---|
| Sodium carbonate/Sodium hydroxide Cooking Liquor | 255,500 | tons/year of dry black liquor solids |
| Process Steam | 1,032,366 | tons/year |
| | | |
| | | |
| | | |

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary): N/A

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, Form ADEM-110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

| Emission Point | Height Above Grade (Feet) | Base Elevation (Feet) | Stack Diameter (Feet) | Stack Gas Exit Velocity (Feet/Sec) | Volume of Gas Discharged (ACFM) | Exit Temperature (°F) |
|---|---|---|---|---|---|---|
| CR-1 (X014) | 200 | 647 | 7.0 | 56.72 | 130,970.5 | 171 |
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* Std temperature is 68°F - Std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

| Emission Point | Pollutants | Potential Emissions | | | Regulatory Emission Limit | |
|---|---|---|---|---|---|---|
| | | (lb/hr) | (Tons/yr) | Basis of Calculation | (lb/hr) | (units of standard) |
| X014 | PM | 17.87 | 78.28 | Vendor Guarantee and AP-42 | <= 43.8 | 0.036 gr/dscf @ 8% O2) |
| X014 | SO2 | 2.92 | 12.78 | Vendor Guarantee and AP-42 | <= 170 | 120 ppm @ 8% O2 3-hr Rolling Avg. |
| X014 | NOx | 72.92 | 319.38 | Vendor Guarantee and AP-42 | <= 72.92 | 120ppmvd @ 8% O2 30-day Rolling Avg. |
| X014 | CO | 87.50 | 383.25 | Vendor Guarantee and AP-42 | <= 87.50 | 200ppmvd @ 8% O2 30-day Rolling Avg. |
| X014 | VOC as C | 8.87 | 38.84 | Vendor Guarantee and AP-42 | <= 8.87 (as Carbon) | 50ppmvd @ 8% O2 3-hr Rolling Avg. |
| X014 | TRS | 0.32 | 1.41 | Vendor Guarantee and AP-42 | <=18.8 | 25ppm @ 8% O2 12-hr Block Avg. |
| X014 | SAM | 1.46 | 6.39 | Vendor Guarantee and AP-42 | <=4.0 | 5ppm @ 8% O2 |
| X014 | Opacity | – | – | – | <=20% | % with one 6-min up to 27% in 1 hour |
| X014 | Gaseous Organic HAPs | – | – | – | 2.97 lb/Ton BLS | lb/Ton BLS or 90% destruction |

12. Using a flow diagram:

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

☐ (Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No

(if "no", a compliance schedule, Form ADEM-437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐ Yes ☑ No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☐ No

List storage piles or other facility (if any):

| Type of material | Particle size (diameter or screen size) | Pile size or facility (average tons) | Methods utilized to control fugitive emissions (wetted, covered, etc.) |
|---|---|---|---|
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Name of person preparing application: Angela Aten

Signature: Angela Aten Date: 5/24/17